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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,556	10/23/2001	Martin Klein	H 2182	4171

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CASELLA & HESPOS
274 MADISON AVENUE
NEW YORK, NY 10016

EXAMINER

LEE, SHUN K

ART UNIT PAPER NUMBER

2878

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,556	KLEIN ET AL.	
	Examin r	Art Unit	<i>AW</i>
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☒ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on 24 October 2000. It is noted, however, that applicant has not filed a certified copy of the 00 122 360.1-2208 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 19' and 34. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The substitute specification filed 28 May 2003 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: it lacks a statement (pg. 6 of remarks filed 28 May 2003) that the substitute specification includes no new matter and a marked up version of the substitute specification showing all the changes (including the matter being added to and the matter being deleted from) to the specification of record.

5. The use of the trademark kapton has been noted in this application. It should be capitalized (*i.e.*, KAPTON) wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

7. Claims 1, 7, 12, and 14 are objected to because of the following informalities:

- (a) in claim 1, "at least one device" on line 10 should probably be --at least one electrical drift field device-- (to avoid confusion with "at least one converter device" and "at least one readout device");

- (b) in claim 7, "them" on line 3 should probably be --the first conductive layer and the second conductive layer--;
- (c) in claim 12, "which contains" on line 1 should probably be --said at least one solid converter layer contains--; and
- (d) in claim 14, "the charge-transparent converter device" on line 10 should probably be --the at least one converter device--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "this device" in line 15 which is vague and indefinite since it is unclear if the antecedent basis for this limitation is "at least one converter device", "at least one readout device", or "at least one device".

The term "large-area" in claims 5 and 6 is a relative term which renders the claim indefinite. The term "large-area" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The specification fails to disclose what distinguishes a "large-area" from an area.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 10 recites the broad recitation 0.1 μm to 10 μm , and the claim also recites 0.5 μm and 3 μm which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1, 2, 4-6, 13, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Danielsson *et al.* (US 6,429,578).

In regard to claim 1 in so far as understood, Danielsson *et al.* disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) a detector for detecting electrically neutral particles, having

(a) a detector housing (column 7, lines 2-14) which at least in certain regions is filled with a counting gas,

(b) at least one converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) which is arranged in the detector housing and generates conversion products (e.g., electrons; column 7, lines 49-54) as a result of the absorption of the neutral particles (e.g., neutrons; column 13, lines 9-11) which are to be detected, the conversion products generating electrically charged particles (e.g., electrons; column 7, lines 54-56) in the counting gas,

(c) at least one readout device (314, 914) for detecting (column 8, lines 36-50) the electrically charged particles; and

(d) at least one electrical drift field device (200, 304a, 304b, 304c, 304d, 304e, 306, 700, 904a, 904b, 904c, 904d, 904e, 906) for generating an electrical drift field for the electrically charged particles in at least a region of the volume of the counting gas in such a manner that at least some of the electrically charged particles drift (i.e., charge collect; column 8, lines 25-35) toward the readout device (314, 914), the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) being of charge-transparent design (i.e., perforated; column 7, lines 39-47) and being arranged in the detector housing in such a manner that the drift field passes

through at least part of said at least one converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d).

In regard to claim 2 which is dependent on claim 1, Danielsson *et al.* also disclose (column 6, lines 14-16) that the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) has a multiplicity of passages for the electrically charged particles.

In regard to claim 4 which is dependent on claim 1, Danielsson *et al.* also disclose (Figs. 3 and 9) a multiplicity of the converter devices (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) arranged in cascade form.

In regard to claim 5 which is dependent on claim 1 in so far as understood, Danielsson *et al.* also disclose (Figs. 3 and 9) that a region of the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) which is active in the conversion is of large-area design and is arranged substantially perpendicularly in the drift field.

In regard to claim 6 which is dependent on claim 1 in so far as understood, Danielsson *et al.* also disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) that the device (200, 304a, 304b, 304c, 304d, 304e, 306, 700, 904a, 904b, 904c, 904d, 904e, 906) for generating a drift field has a large-area structured drift electrode (206, 208, 306, 704, 712, 906) to generate the drift field between the drift electrode and the readout device (314, 914).

In regard to claim 13, Danielsson *et al.* disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) a method for producing a converter device for a detector for detecting electrically neutral

particles comprising the following steps: providing an insulator layer (204, 706, 710) which is arranged between two electrically conductive layers (206, 208, 704, 710), so that the electrically conductive layers (206, 208, 704, 710) are electrically insulated from one another, and providing a converter layer (302a, 302b, 302c, 302d, 708).

In regard to claim 14, the method steps are implicit for the apparatus of Danielsson *et al.* since the structure is the same as the applicant's apparatus of claims 1 and 2.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 3, 7, 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson *et al.* (US 6,429,578) in view of Sauli (US 6,011,265).

In regard to claim **3** which is dependent on claim 2, while Danielsson *et al.* also disclose (column 7, lines 39-41) that the passages are aligned with the holes in the GEM structure, the detector of Danielsson *et al.* lacks an explicit description that the passages have a minimum diameter of between 10 μm and 1000 μm , and a minimum spacing of 10 μm to 500 μm . However, GEM structures are known in the art. For example, Sauli teaches (Fig. 4f; Tables 1 and 3) that a GEM structure have diameters D of for example, 110 μm and 130 μm , and a minimum spacing P of 140 μm to 200 μm . Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide passages in the detector of Danielsson *et al.* having a minimum diameter of between 10 μm and 1000 μm , and a minimum spacing of 10 μm to 500 μm ., in order to align the passages to the holes in the known GEM structure.

In regard to claim **7** which is dependent on claim 1, Danielsson *et al.* also disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) that the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) comprises a first conductive layer (704) and a second conductive layer (712), which are electrically insulated from one another by an insulator layer (706, 710) arranged between the first conductive layer (704) and the second conductive layer (712). While Danielsson *et al.* further disclose (Figs. 7a and 7b) that the at least one converter layer (708) can be integrated into the GEM structure (704, 706, 710, 712), the detector of Danielsson *et al.* lacks an explicit description that the at least one converter layer is arranged on at least one of the first conductive layer and the second conductive layer. However, GEM structures with an integrated converter layer are known in the art. For example, Sauli teaches (Fig. 10) that a GEM

structure (11, 10, 12) with an integrated converter layer (PhC) arranged on at least one of the first conductive layer (11) and the second conductive layer (12) minimizes damage to the converter layer from positive ions (column 23, lines 36-44). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to integrate the at least one converter layer in the detector of Danielsson *et al.* onto at least one of the first conductive layer and the second conductive layer, in order to minimize damage to the converter layer from positive ions.

In regard to claim 8 which is dependent on claim 7, Danielsson *et al.* also disclose (Figs. 7a and 7b) that the first conductive layer (704) and the second conductive layer (712) are electrically connected to a device for generating a converter field.

In regard to claim 11, Danielsson *et al.* in view of Sauli is applied as in claim 7 above.

15. Claims 9, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson *et al.* (US 6,429,578) in view of Sauli (US 6,011,265) as applied to claim 8 above, and further in view of Gleason (US 3,956,654).

In regard to claim 9 (which is dependent on claim 8) and claim 12 (which is dependent on claim 11), while Danielsson *et al.* also disclose (column 13, lines 9-11) that the converter layer is a neutron converter layer, the modified apparatus of Danielsson *et al.* lacks an explicit description that the neutron converter layer contains at least one of lithium-6, boron-10, gadolinium-155, gadolinium-157 and uranium-235. However, neutrons detectors are well known in the art. For example, Gleason teaches

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(column 1, lines 9-36) that boron-10 is a widely used converter layer for detecting neutrons. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide boron-10 for the converter layer in the modified apparatus of Danielsson *et al.*, in order to detect neutrons.

In regard to claim **10** which is dependent on claim 9 in so far as understood, Danielsson *et al.* also disclose (column 6, lines 24-56) that the first and second conductive layers have a layer thickness of 5 μm (*i.e.*, from 0.1 μm to 20 μm) and the insulator layer has a layer thickness of 50 μm (*i.e.*, from 10 μm to 500 μm). The modified detector of Danielsson *et al.* lacks that the neutron converter layer substantially consisting of between 0.5 μm and 3 μm layer thickness of boron-10. However, neutron converter layers are well known in the art. For example, Gleason teaches (column 1, lines 9-36) that a neutron converter layer comprises an absorptive coating of a material having a high neutron cross-section such as boron-10. In addition, Danielsson *et al.* further disclose (column 13, lines 9-11) that the detector can be optimized for detecting neutrons as is known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to optimize the thickness (*e.g.*, from 0.5 μm and 3 μm) of a boron-10 absorptive coating as the converter layer in the modified detector of Danielsson *et al.*, in order to detect neutrons with a desired efficiency.

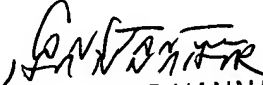
Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SL


CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2878